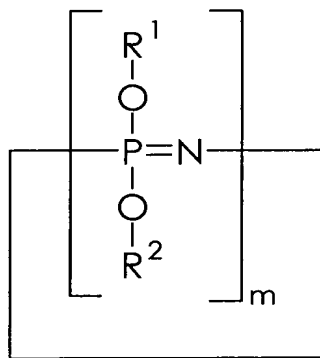


## CLAIMS

1. A phosphazene compound, obtained by reacting a phenoxyphosphazene compound (A-1) having a phenolic hydroxyl group and/or a cross-linked phenoxyphosphazene compound (A-2) obtained by cross-linking the phenoxyphosphazene compound (A-1) with an epoxy compound (B) having an unsaturated double bond and/or an isocyanate compound (C), wherein the phosphazene compound has an unsaturated double bond in its molecule.

2. The phosphazene compound as set forth in claim 1, wherein the phenoxyphosphazene compound (A-1) is a circular phenoxyphosphazene compound (A-11) represented by formula (1)

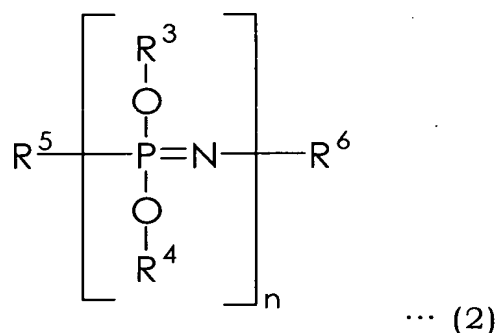


... (1)

where m represents an integer ranging from 3 to 25, and each of R<sup>1</sup> and R<sup>2</sup> represents a phenyl group or a hydroxyphenyl group, and a single molecule has one or

more hydroxyphenyl groups.

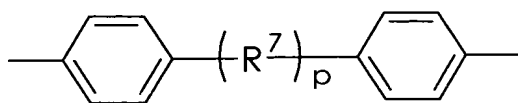
3. The phosphazene compound as set forth in claim 1, wherein the phenoxyphosphazene compound (A-1) is a chain phenoxyphosphazene compound (A-12) represented by formula (2)



where n represents an integer ranging from 3 to 10000, and each of R<sup>3</sup> and R<sup>4</sup> represents a phenyl group or a hydroxyphenyl group, and a single molecule has one or more hydroxyphenyl groups, and R<sup>5</sup> represents -N=P(OC<sub>6</sub>H<sub>5</sub>)<sub>3</sub>, -N=P(OC<sub>6</sub>H<sub>5</sub>)<sub>2</sub>(OC<sub>6</sub>H<sub>4</sub>OH), -N=P(OC<sub>6</sub>H<sub>5</sub>)(OC<sub>6</sub>H<sub>4</sub>OH)<sub>2</sub>, -N=P(OC<sub>6</sub>H<sub>4</sub>OH)<sub>3</sub>, -N=P(O)OC<sub>6</sub>H<sub>5</sub>, or -N=P(O)(OC<sub>6</sub>H<sub>4</sub>OH), and R<sup>6</sup> represents -P(OC<sub>6</sub>H<sub>5</sub>)<sub>4</sub>, -P(OC<sub>6</sub>H<sub>5</sub>)<sub>3</sub>(OC<sub>6</sub>H<sub>4</sub>OH), -P(OC<sub>6</sub>H<sub>5</sub>)<sub>2</sub>(OC<sub>6</sub>H<sub>4</sub>OH)<sub>2</sub>, -P(OC<sub>6</sub>H<sub>5</sub>)(OC<sub>6</sub>H<sub>4</sub>OH)<sub>3</sub>, -P(OC<sub>6</sub>H<sub>4</sub>OH)<sub>4</sub>, -P(O)(OC<sub>6</sub>H<sub>5</sub>)<sub>2</sub>, -P(O)(OC<sub>6</sub>H<sub>5</sub>)(OC<sub>6</sub>H<sub>4</sub>OH), or -P(O)(OC<sub>6</sub>H<sub>4</sub>OH)<sub>2</sub>.

4. The phosphazene compound as set forth in any one of claims 1 to 3, wherein the cross-linked

phenoxyphosphazene compound (A-2) is obtained by cross-linking the phenoxyphosphazene compound (A-1) on the basis of a phenylene cross-linking group having at least one of an o-phenylene group, a m-phenylene group, a p-phenylene group, and a bisphenylene group represented by formula (3)



... (3)

where  $R^7$  represents  $-C(CH_3)_2-$ ,  $-SO_2-$ ,  $-S-$ , or  $-O-$ , and  $p$  represents 0 or 1.

5. The phosphazene compound as set forth in claim 4, wherein

the cross-linked phenoxyphosphazene compound (A-2) is a phenylene cross-linked phenoxyphosphazene compound (A-3) in which

the circular phenoxyphosphazene compound (A-11) and/or the chain phenoxyphosphazene compound (A-12) is used as the phenoxyphosphazene compound, and

the phenylene cross-linking group intervenes between two oxygen atoms obtained by desorbing a phenyl group and a hydroxyphenyl group from the phenoxyphosphazene compound (A-1) so that a ratio at

which the phenyl group and the hydroxyphenyl group are contained in the cross-linked phenoxyphosphazene compound ranges from 50 to 99.9 % with respect to a total of a phenyl group and a hydroxyphenyl group of the phenoxyphosphazene compound, the phenylene cross-linked phenoxyphosphazene compound (A-3) including at least one phenolic hydroxyl group.

6. A photosensitive resin composition, comprising at least the phosphazene compound as set forth in any one of claims 1 to 5 and a soluble polyimide resin (D) which is soluble in an organic solvent.

7. The photosensitive resin composition as set forth in claim 6, further comprising a photoreaction initiator (E-1).

8. A photosensitive resin composition, comprising at least the phosphazene compound as set forth in any one of claims 1 to 5 and a photoreaction initiator (E-1).

9. The photosensitive resin composition as set forth in any one of claims 6 to 8, further comprising a compound having a carbon-carbon double bond (E-4).

10. The photosensitive resin composition as set forth in claim 6, wherein 1 wt% or more of the soluble polyimide resin (D) is dissolved in at least one kind of an organic solvent selected from dioxolane, dioxane, tetrahydrofuran, N,N-dimethylformamide, N,N-dimethylacetamide, and N-methyl-2-pyrrolidone at temperature ranging from room temperature to 100°C.

11. A photosensitive resin film, being formed by using the photosensitive resin composition as set forth in any one of claims 6 to 10.

12. The photosensitive resin film as set forth in claim 11, being used as a print wiring board adhesive sheet, a photosensitive cover lay film, a print wiring insulative protection film, or a print wiring board substrate.

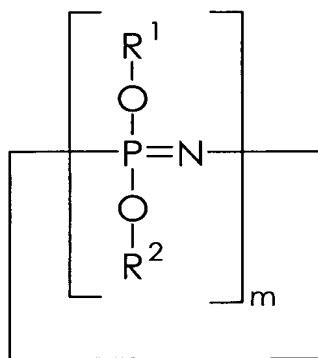
13. A photosensitive resin composition having at least a polyimide resin (G) and a phosphazene compound (H),

said photosensitive resin composition comprising: a soluble polyimide resin (G-1), which has a carboxyl group and/or a hydroxyl group and is soluble in an organic solvent, as the polyimide resin (G); and

a phenoxyphosphazene compound (H-1) having a phenolic hydroxyl group and/or a cross-linked phenoxyphosphazene compound (H-2), which is obtained by cross-linking the phenoxyphosphazene compound (H-1) and has at least one phenolic hydroxyl group, as the phosphazene compound (H),

said photosensitive resin composition further comprising a (meth)acrylic compound (I).

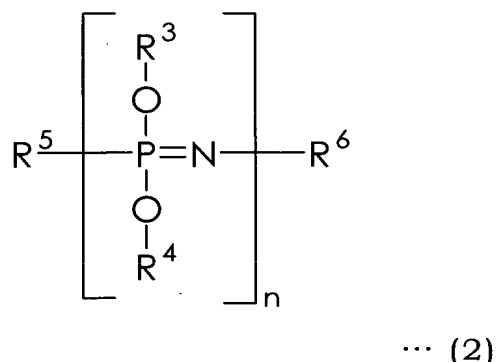
14. The photosensitive resin composition as set forth in claim 13, wherein the phenoxyphosphazene compound (H-1) includes a circular phenoxyphosphazene compound (H-11) represented by formula (1)



... (1)

where m represents an integer ranging from 3 to 30, and each of R1 and R2 represents a phenyl group or a hydroxyphenyl group, and a single molecule has one or more hydroxyphenyl groups.

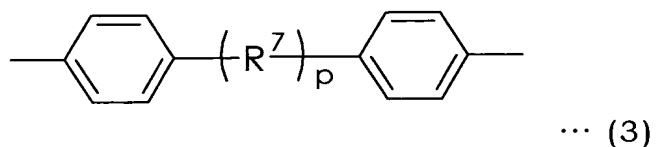
15. The photosensitive resin composition as set forth in claim 13, wherein the phenoxyphosphazene compound (H-1) includes a chain phenoxyphosphazene compound (H-12) represented by formula (2)



where n represents an integer ranging from 3 to 10000, and each of R<sup>3</sup> and R<sup>4</sup> represents a phenyl group or a hydroxyphenyl group, and a single molecule has one or more hydroxyphenyl groups, and R<sup>5</sup> represents -N=P(OC<sub>6</sub>H<sub>5</sub>)<sub>3</sub>, -N=P(OC<sub>6</sub>H<sub>5</sub>)<sub>2</sub>(OC<sub>6</sub>H<sub>4</sub>OH), -N=P(OC<sub>6</sub>H<sub>5</sub>)(OC<sub>6</sub>H<sub>4</sub>OH)<sub>2</sub>, -N=P(OC<sub>6</sub>H<sub>4</sub>OH)<sub>3</sub>, -N=P(O)OC<sub>6</sub>H<sub>5</sub>, or -N=P(O)(OC<sub>6</sub>H<sub>4</sub>OH), and R<sup>6</sup> represents -P(OC<sub>6</sub>H<sub>5</sub>)<sub>4</sub>, -P(OC<sub>6</sub>H<sub>5</sub>)<sub>3</sub>(OC<sub>6</sub>H<sub>4</sub>OH), -P(OC<sub>6</sub>H<sub>5</sub>)<sub>2</sub>(OC<sub>6</sub>H<sub>4</sub>OH)<sub>2</sub>, -P(OC<sub>6</sub>H<sub>5</sub>)(OC<sub>6</sub>H<sub>4</sub>OH)<sub>3</sub>, -P(OC<sub>6</sub>H<sub>4</sub>OH)<sub>4</sub>, -P(O)(OC<sub>6</sub>H<sub>5</sub>)<sub>2</sub>, -P(O)(OC<sub>6</sub>H<sub>5</sub>)(OC<sub>6</sub>H<sub>4</sub>OH), or -P(O)(OC<sub>6</sub>H<sub>4</sub>OH)<sub>2</sub>.

16. The photosensitive resin composition as set forth in any one of claims 13 to 15, wherein the cross-linked phenoxyphosphazene compound (H-2) is obtained by cross-linking the phenoxyphosphazene

compound (H-1) on the basis of a phenylene cross-linking group having at least one of an o-phenylene group, a m-phenylene group, a p-phenylene group, and a bisphenylene group represented by formula (3)



where  $\text{R}^7$  represents  $-\text{C}(\text{CH}_3)_2-$ ,  $-\text{SO}_2-$ ,  $-\text{S}-$ , or  $-\text{O}-$ , and  $p$  represents 0 or 1.

17. The photosensitive resin composition as set forth in claim 16, wherein the cross-linked phenoxyphosphazene compound (H-2) is a phenylene cross-linked phenoxyphosphazene compound (H-21) in which

the circular phenoxyphosphazene compound (H-11) and/or the chain phenoxyphosphazene compound (H-12) is used as the phenoxyphosphazene compound, and

the phenylene cross-linking group intervenes between two oxygen atoms obtained by desorbing a phenyl group and a hydroxyphenyl group from the phenoxyphosphazene compound (H-1) so that a ratio at which the phenyl group and the hydroxyphenyl group are contained in the cross-linked phenoxyphosphazene



compound ranges from 50 to 99.9 % with respect to a total of a phenyl group and a hydroxyphenyl group of the phenoxyphosphazene compound, said phenylene cross-linked phenoxyphosphazene compound (H-21) including at least one phenolic hydroxyl group.

18. The photosensitive resin composition as set forth in any one of claims 13 to 17, wherein the soluble polyimide resin (G-1) has at least one kind of an unsaturated double bond selected from an acryl group, a methacryl group, a vinyl group, and an allyl group.

19. The photosensitive resin composition as set forth in any one of claims 13 to 18, wherein an amount of the phosphazene compound (H) ranges from 1 to 100 parts by weight with respect to 100 parts by weight corresponding to a total weight of the polyimide resins (G) and the (meth)acrylic compound (I).

20. A photosensitive resin film, being formed by using the photosensitive resin composition as set forth in any one of claims 13 to 19.

21. The photosensitive resin film as set forth in claim 20, wherein: in case of using 1 wt% of sodium

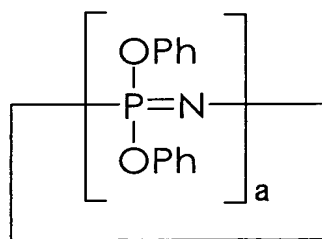
hydroxide whose temperature is 40°C as a developer and using a spray developing device as developing means,

dissolution time under a spray pressure of 0.85 MPa is 180 seconds or less.

22. The photosensitive resin film as set forth in claim 20 or 21, being used as a pattern circuit resist film, a photosensitive cover lay film, or a photosensitive dry film resist.

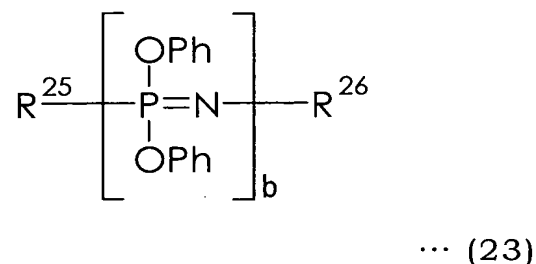
23. A photosensitive resin composition, comprising a soluble polyimide resin (K) having a carboxyl group and/or a hydroxyl group, a phenoxyphosphazene compound (L), and a (meth)acrylic compound (M),

said phenoxyphosphazene compound (L) including at least one of a circular phenoxyphosphazene compound (L-1) represented by formula (22) and a chain phenoxyphosphazene compound (L-2) represented by formula (23),



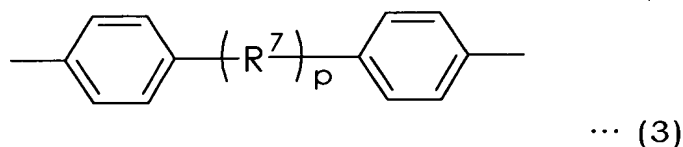
... (22)

where a represents an integer ranging from 3 to 30,



where  $\text{R}^{25}$  represents group- $\text{N}=\text{P}(\text{OPh})_3$  or group- $\text{N}=\text{P}(\text{O})\text{OPh}$ , and  $\text{R}^{26}$  represents group- $\text{P}(\text{OPh})_4$  or group- $\text{P}(\text{O})(\text{OPh})_2$ , and b represents an integer ranging from 3 to 10000, wherein

the phenoxyphosphazene compound (L) includes a cross-linked phenoxyphosphazene compound (L-3) having a structure cross-linked by causing a cross-linking group having any one of an o-phenylene group, an m-phenylene group, a p-phenylene group, and a bisphenylene group represented by formula (3) to intervene between two oxygen atoms obtained by desorbing a phenyl group,



where  $\text{R}^7$  represents  $-\text{C}(\text{CH}_3)_2-$ ,  $-\text{SO}_2-$ ,  $-\text{S}-$ , or  $-\text{O}-$ , and p represents 0 or 1.

24. The photosensitive resin composition as set forth in claim 23, wherein a soluble polyimide resin

serving as the component (K) has at least one kind of a carbon-carbon double bond selected from an acryl group, a methacryl group, a vinyl group, and an allyl group.

25. The photosensitive resin composition as set forth in claim 23 or 24, wherein an amount of the component (L) ranges from 1 to 100 parts by weight with respect to 100 parts by weight corresponding to a total weight of the components (K) and (L).

26. A photosensitive dry film resist, produced by using the photosensitive resin composition as set forth in any one of claims 23 to 25.

27. The photosensitive dry film resist as set forth in claim 26, wherein: in case of using 1 wt% of sodium hydroxide whose temperature is 40°C as a developer and using a spray developing device as developing means,

dissolution time under a spray pressure of 0.85 MPa is 180 seconds or less.

28. A print wiring board, using the photosensitive dry film resist as set forth in claim 26 or 27 as an insulative protection layer.